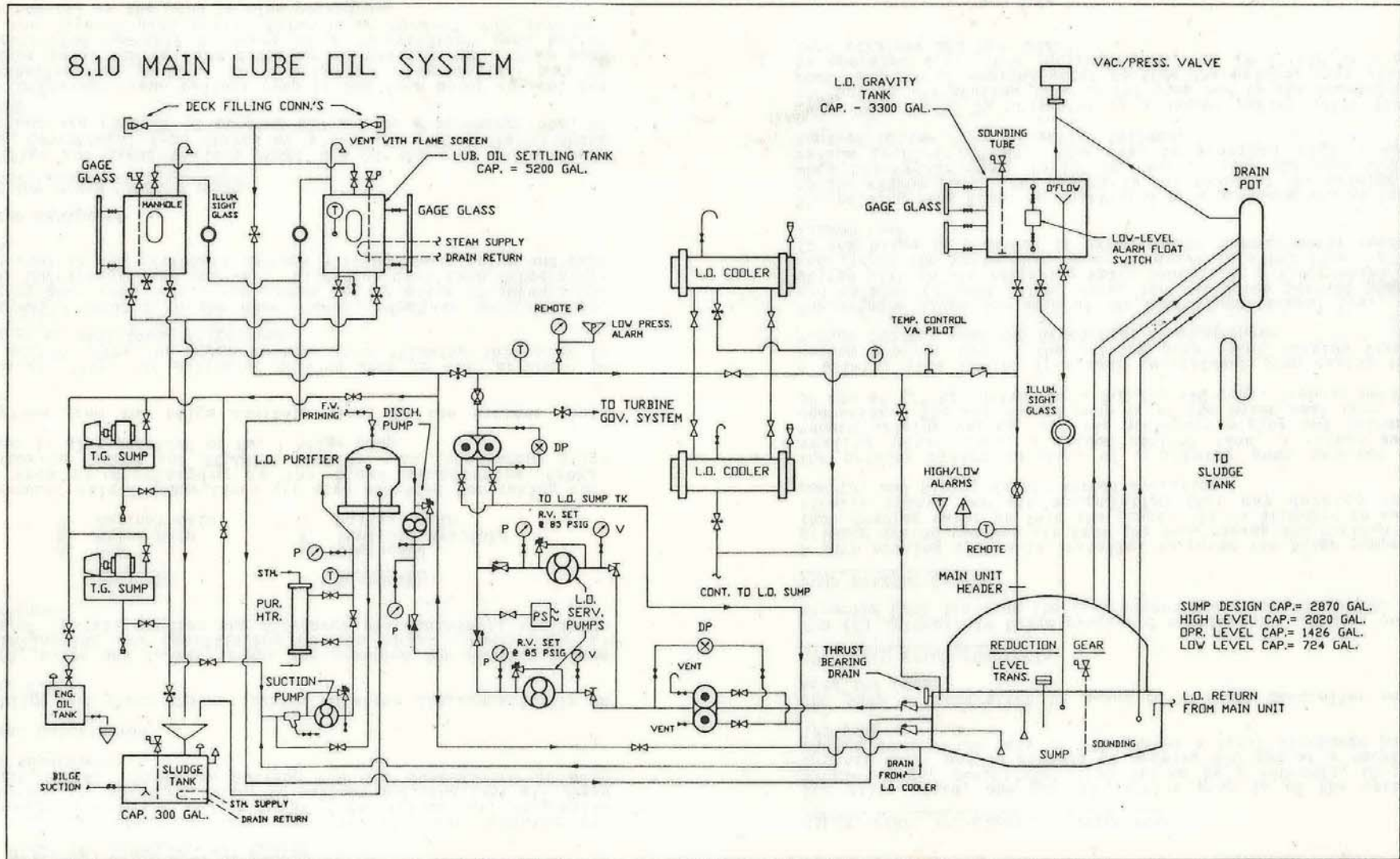


8.10 MAIN LUBE OIL SYSTEM



8.10 Main Lube Oil System

The primary purpose of the main lube oil service system is to supply lubricating oil at the proper pressure and temperature to the main propulsion turbines and reduction gears.

General Description

The main lube oil service system is shown diagrammatically on Figure 8.10.

A pressure gravity type system is provided for the main propulsion unit. An oil sump built into the base of the main reduction gear unit serves as a collecting reservoir for oil drains from the gears and bearings of the main propulsion unit as well as a supply to the suction of the lube oil service pump.

Two (2) lubricating oil service pumps are provided to supply oil to the main propulsion unit. One pump is normally running with the other serving as stand-by. The pumps take suction from the sump through a common suction line and strainer, and discharge through lube oil coolers to the supply header. This supply header is provided with a variable orifice for controlling the pressure of oil to the bearings with the excess oil flowing up to the gravity tank. Overflow from the gravity tank is directed back to the sump by means of a 5-inch overflow line. The overflow line is provided with an illuminated sight glass for observation of overflow from the COS.

A duplex magnetic strainer is provided on the discharge of the pumps to collect any foreign material.

A branch line off the pump discharge, before the lube oil coolers, supplies oil to the steam seal regulator and turbine governor system. Pressure in this portion of the lube oil service system is regulated by means of a variable orifice.

A 2-inch discharge connection to the filling and transfer system is provided for transferring oil from the sump to the storage tank, settling tank, or deck filling connections.

A 2-inch warm-up recirculating line is provided on the outlet of the lube oil coolers for recirculating oil back to the sump during warm-up operation.

Related Equipment

LUBE OIL SERVICE PUMPS

Two (2) main lube oil service pumps are installed to serve the main propulsion unit.

The lube oil service pumps are of the vertical, rotary, IMO positive displacement type, driven by a 440-volt, 60-cycle, 3-phase motor. Each pump is capable of pumping 450 gpm at 75 psig discharge head.

The control units for No. 1 and 2 lube oil service pumps are located at Motor Control Centers "A" and "B" respectively.

Each control unit is provided with "Start-Stop" push button for controlling the pumps. A remote master switch is also provided locally at the pump.

Both pumps are also controlled by means of a 3-point mode selector switch at the COS, with one pump normally running and the other in stand-by.

A pressure sensing switch, which senses discharge pressure of the running pump, automatically starts the stand-by pump when the lube oil pressure drops to approximately 65 psig. The stand-by pump will continue running until stopped by means of the "Stop" push button located at the pump, or by means of the selector switch at the COS.

LUBE OIL COOLERS

Two (2) lube oil coolers are provided for cooling the lube oil. Each cooler is capable of handling the oil requirements of the system.

The coolers are so connected that they may be operated individually or in parallel. A by-pass is also provided. A valved vent and drain allows the coolers (shell side) to be vented and drained.

A connection is provided in the water inlet head of each cooler to admit steam for warming the oil, if necessary, prior to starting up the main propulsion unit. Steam for this purpose is supplied from the contaminated steam system.

GRAVITY TANK

A 3054 gallon (point of overflow) capacity gravity tank is provided as an emergency source of supply to the propulsion unit. This tank is kept full by means of excess oil not required for bearing lubrication when the lube oil service pump is running. A variable orifice in the supply line to the bearings controls the oil for bearing lubrication with the excess flowing to the gravity tank. Overflow from the gravity tank is directed to the sump. The tank provides approximately 8 minute supply upon shutdown of the lube oil service pump. A low level alarm set at one (1) foot below the overflow level is provided. The tank is also provided with a gage glass, vent and drain connection.

SUMP TANK

A sump tank built into the base of the reduction gear serves to collect oil drains from the turbine bearings, reduction gear bearings, spray nozzles, main thrust bearing, lube oil coolers, over-speed relays, steam seal regulator, and ahead and astern governing valves.

A remote tank level indicator, located on the COS is provided for indicating sump capacity. A sounding tube is also provided for determining tank level.

High and low level alarms are also provided at the COS to warn the operator of either high or low level in the sump. The lube oil low level alarm is set at 18 inches or 724 gallons. The high oil level alarm is set at 33 inches or 2020 gallons.

STORAGE TANK

A storage tank with a capacity of 4600 gallons is installed as part of the lube oil system and is used for clean oil. The tank is provided with a gauge glass, drain, vent and overflow.

The tank is normally filled from deck by means of the deck filling connections and may also be filled from the lube oil purifier discharge or by either main lube oil service pump.

SETTLING TANK

A settling tank with a capacity of 5200 gallons is provided for storage of contaminated oil. This tank is provided with heating coils for heating the oil, to increase the separation of water and oil. The tank is provided with a gage glass, thermometer, drain, vent and overflow. The tank may be filled by means of the deck filling connections, the lube oil purifier discharge, or lube oil pump discharge.